FORM PTO-1390 (REV 10-94)	U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		9320.128USWO

	US APPLICATION NO (If known, see 37 C F R 1 5)
	Unknown **09/856002**

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/FR99/02812	November 16, 1999	November 16, 1998

TITLE OF INVENTION

VIRTUAL SHOW AREA AT NOMINAL SCALE

APPLICANT(S) FOR DO/EO/US

FUCHS et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(l).
4. [X] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
    a. [ ] is transmitted herewith (required only if not transmitted by the International Bureau).
    b. [X] has been transmitted by the International Bureau.
    c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US)
6. [X] A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. [X] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
    a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
    b. [ ] have been transmitted by the International Bureau.
    c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
    d. [X] have not been made and will not be made.

8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

9. [X] An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).

10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:
11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. [X] A FIRST preliminary amendment.
    [ ] A SECOND of SUBSEQUENT preliminary amendment.

14. [ ] A substitute specification.

15. [ ] A change of power of attorney and/or address letter.

16. [X] Other items or information: Form 1449, cited references; Front page of PCT appln as filed; International Search Report; International Preliminary Examination Report

U.S. APPLICATION NO. (If known, see 37 C F R 1 5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
Unknown **09/856002**	PCT/FR99/02812	9320.128USWO

17. [X] The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492(a) (1)-(5)):

Search Report has been prepared by the EPO or JPO..$860.00

International preliminary examination fee paid to USPTO
(37 CFR 1.492(a)(1))..$690.00

No international preliminary examination fee paid to USPTO (37 CFR 1.482)
but international search fee paid to USPTO (37 CFR 1.445(a)(2)).............................$710.00

Neither international preliminary examination fee (37 CFR 1.482) nor
international search fee (37 CFR 1.445(a)(3)) paid to USPTO $1000.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)
and all claims satisfied provisions of PCT Article 33(2)-(4) $100.00

CALCULATIONS PTO USE ONLY		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	

Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$0	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	14 -20 =	0	X $18.00	$0	
Independent claims	2 -3 =	0	X $80.00	$0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $260.00	$0	

TOTAL OF ABOVE CALCULATIONS =	$860.00	
Reduction by 1/2 for filing by small entity, if applicable. Small entity status is claimed pursuant to 37 CFR 1.27	$0	
SUBTOTAL =	$860.00	
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f). +	$0	
TOTAL NATIONAL FEE =	$860.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +	$0	
TOTAL FEES ENCLOSED =	$860.00	

	Amount to be: refunded	$0
	charged	$0

a. [X] Check in the amount of $860.00 to cover the above fees is enclosed.

b. [ ] Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 13-2725.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO
John J. Gresens
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SIGNATURE: _____

NAME: Brian H. Batzli

REGISTRATION NUMBER: 32,960

JC18 Rec'd PCT/PTO 1 5 MAY 2001

S/N unknown   PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	FUCHS et al.	Docket No.:	9320.128USWO
Serial No.:	unknown	Filed:	concurrent herewith
Int'l Appln No.:	PCT/FR99/02812	Int'l Filing Date:	November 16, 1999
Title:	VIRTUAL SHOW AREA AT NOMINAL SCALE		

PRELIMINARY AMENDMENT

Box PCT
Assistant Commissioner for Patents
Washington, D. C. 20231

Dear Sir:

In connection with the above-identified application filed herewith, please enter the following preliminary amendment:

IN THE ABSTRACT

Insert the attached Abstract page into the application as the last page thereof.

IN THE SPECIFICATION

A courtesy copy of the present specification is enclosed herewith. However, the World Intellectual Property Office (WIPO) copy should be relied upon if it is already in the U.S. Patent Office.

REMARKS

A new abstract page is supplied to conform to that appearing on the publication

page of the WIPO application, but the new Abstract is typed on a separate page as required by
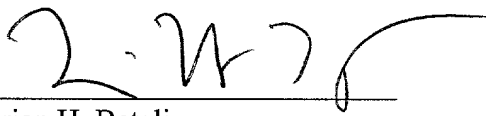
U.S. practice.

Applicants respectfully request that the preliminary amendment described herein

be entered into the record prior to calculation of the filing fee and prior to examination and

consideration of the above-identified application.

If a telephone conference would be helpful in resolving any issues concerning this

communication, please contact Applicants' primary attorney-of-record, John J. Gresens (Reg. No.

33,112), at (612) 371.5265.

<div align="right">

Respectfully submitted,

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</div>

Dated: May 15, 2001   By_____

Brian H. Batzli
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JJG/tvm

2

ABSTRACT

Title: VIRTUAL SHOW AREA AT NOMINAL SCALE

The invention concerns a method for producing a virtual exhibition space, in particular a store, on a nominal scale. Said method comprises steps which consist in: breaking down the basic image representing a display unit into several pre-computed sub images; projecting the sub images onto a screen using several video projectors; producing, in three dimensions, a graphic model of the objects displayed on the display unit; virtually manipulating said object, using an interface, such that the user can, as in a real exhibition space, acquire the three-dimensional representation of the virtual object, move it and turn it around in all directions, while preserving in his visual field the display unit, on a nominal scale.

VIRTUAL SHOW AREA AT NOMINAL SCALE

This invention relates to a process for making a virtual show area at nominal scale. It also relates to a virtual show area, and particularly a virtual shop, at nominal scale.

5 Large distribution companies carry out studies in order to calculate the chances of success of their new products. Tests carried out include tests in shops. "Artificial" supermarkets are thus formed comprising different departments, some of which contain the new

10 products to be tested. Consumers are invited to do their shopping from a list of products. Their choices and their behaviours are analysed while they are doing their shopping and subsequently in an individual interview. The results are used mainly to study the

15 impact of the outside appearance of the product (packaging) and to predict future sales of the new product.

It was proposed to replace the "artificial" shop by a virtual experimental shop, making a supermarket as

20 realistically as possible using new projection and immersion techniques recently developed in the virtual reality field.

The problem that arises is to make a virtual shop enabling the person to do his or her shopping naturally

in the same way as in a supermarket. The shopper must be able to move between departments, stop in front of the department in which he or she is interested, choose a product, handle it and put it in the shopping basket.

5   More generally, the problem that arises is to make a virtual show area (for example an art gallery) and offer the visitor the possibility of moving around as he or she wishes and to handle objects, animals and plants in it.

10   This is the objective of this invention.

According to the invention, the process for making a virtual show area, and particularly a shop, in which the user is immersed in an environment corresponding to the environment of a real show area, particularly
15 concerning the dimensions, distances and field of vision, comprises the following steps.

The process comprises a step in which the basic image representing a display case at the nominal scale, particularly shelves, is broken down into a
20 predetermined number of precalculated sub-images.

The process according to the invention also includes the step in which the precalculated sub-images are projected without overlap onto a screen using several video projectors. The expression "without
25 overlap" means that the sub-images do not overlap. This technique means that relatively economic video projectors (low equipment and installation cost) can be used without reducing the quality of the projected image, provided that appropriate measures described
30 below are applied according to the invention. Advantageously, there are six video projectors.

The process according to the invention also comprises a step in which the said video projectors are synchronized by means of at least one personal computer.
35 Advantageously, three personal computers are used in the network. Thus, the high-resolution image composed of

sub-images projected by video projectors synchronized by the computers, forms a virtual display case at nominal scale.

The process according to the invention also comprises steps in which:

- a graphic model of one of the objects presented on the display case is created in three dimensions,

- the said virtual object can be manipulated by means of a user-virtual display case interface.

Thus, as in a real show area, the user can pick up the 3D representation of the virtual object on the display case, move it and turn it in all directions while keeping the display case within his field of vision in the background at nominal scale alongside the other objects presented on it.

Preferably, a single modelled 3D object is manipulated during the manipulation phase in order to reduce the necessary calculation power, without reducing the realism of the virtual show area.

Advantageously, a modelled 3D object is manipulated by sensing the movements of the user's hand(s) by means of a three dimensional positioning sensor with six degrees of freedom, connected to the user – virtual display case interface. In particular, the said user – virtual display case interface is in the form of a trolley with the same characteristics as the trolleys used in real shops. Also advantageously, the three-dimensional positioning sensor is in the form of a manipulable object, particularly a parallelepiped or a ball that the user holds in his or her hand(s).

Preferably, the user – virtual display case interface comprises control means that the user can use to indicate the display case on which the object(s) that he or she wants to see and/or manipulate are located. In this case, the process according to the invention

also comprises the step in which images projected onto the screen are changed as a function of information provided by the user. Thus, the process can simulate a movement of the user in the show area.

5   Advantageously, the control means comprise position and/or orientation sensors, particularly located on the trolley. In this case, the process according to the invention also comprises a step in which the user's position and/or orientation relative to the virtual

10 display case can be changed as a function of information supplied by the sensors.

     This invention also relates to a virtual show area, particularly a virtual shop at nominal scale such that the user is immersed in an environment corresponding to

15 the environment of a real show area, particularly concerning the dimensions, distances and field of vision.

     The virtual show area comprises first calculation means to breakdown the basic image representing a

20 display case at nominal scale, particularly shelves, into a predetermined number of precalculated sub-images. The virtual show area also comprises several video projectors, advantageously six, designed to project the precalculated sub-images onto a screen without overlap.

25 The virtual show area also comprises synchronization means to synchronize the said video projectors using one or several (advantageously three) networked personal computers. Thus, the high-resolution image composed of sub-images projected by the video projectors

30 synchronized by the computers, forms a virtual display case with the real dimensions of a display case.

     The virtual show area also comprises:

     -     second calculation means for calculating a graphic model of one of the objects displayed on the

35 display case, in three dimensions,

- a user - virtual display case interface comprising manipulation means for virtually manipulating the said object.

Thus, as in a real show area, the user can pick up
5 the 3D representation of the virtual object on the display case, move it and rotate it in all directions while the display case and other objects presented with the display case remain in the background within his field of vision at nominal scale.

10 Preferably, the manipulation means can only manipulate one modelled 3D object during the manipulation phase, in order to reduce the necessary calculation power without reducing the realism of the virtual show area.

15 Also preferably, the user - virtual display case interface comprises a three-dimensional positioning sensor with six degrees of freedom, in order to pick up the movements of the user's hand(s) and to manipulate modelled 3D object. Advantageously, the user - virtual
20 display case interface is in the form of a trolley with the same characteristics as trolleys used in show areas and shops. Also advantageously, the three-dimensional positioning sensor is in the form of a manipulable object, particularly a parallelepiped or a ball that the
25 user holds in his or her hand(s).

Preferably, the user - virtual display case interface comprises control means that the user can use to indicate the display case on which the object(s) that he or she wants to see and/or manipulate are located.
30 In this case, the virtual show area comprises third calculation means for changing the images projected on the screen as a function of the information supplied by the user. Thus, the sub-images projected on the screen simulate displacements of the user in the show area.
35 Advantageously, control means include position and/or

orientation sensors, particularly located on the trolley.

Other characteristics and advantages of the invention will become obvious after reading the description of variant embodiments of the invention given as non-restrictive examples for information, and:

- figure 1 that contains a diagrammatic perspective view of a variant embodiment of the system according to the invention, for the case of a virtual shop,

- figure 2 that shows the reconstituted image of a display case as it appears on the screen described with reference to figure 1.

We will now describe a variant embodiment of the system according to the invention for the case of virtual shop, with reference to figures 1 and 2.

The virtual shop 1 comprises first calculation means 7 for breaking down the basic image 20 representing a display case at nominal scale, and particularly shelves 21, into a predetermined number of precalculated sub-images. Much greater levels of detail are possible with precalculated images than would be possible with an image calculated in real time. Thus, it becomes possible to project shadows, calculate reflections, details of the background. In the case of the variant embodiment described, the basic image 20 is broken down into six sub-images 20a, 20b, 20c, 20d, 20e and 20f. Six video projectors 8a, 8b, 8c, 8d, 8e and 8f operate in cooperation to project the precalculated sub-images 20a, 20b, 20c, 20d, 20e and 20f onto a screen 9 located at a distance of a few meters. All the sub-images form a high-resolution image with the real dimensions of a display case 20.

The display characteristics of the image 20 on the screen 9 are determined based on the normal distance of the person looking at the shelves in a shop. This

distance is one meter. The visual separation power is also taken into consideration; for an emmetropic eye, this value is an angle of 2' for two black points on a light background.   A 4 m long by 2 m high very high resolution image can be obtained by combining six video projectors each with a resolution of 1024 x 768 pixels or 1280 x 1024 pixels, resulting in 3072 x 1536 pixels for XGA type video projectors or 3840 x 2048 pixels for SXGA type video projectors.   Thus, the user 2 is immersed in an environment corresponding to the environment of a display case in a real shop, particularly concerning the length 3 (4 m) and the height 4 (2 m), the distance 5 from the display case (1 m), and the field of vision 6.

The virtual shop comprises synchronization means 10 to synchronize the said video projectors 8a, 8b, 8c, 8d, 8e and 8f by means of three networked PC compatible personal computers 10a, 10b, 10c. These three computers are connected to the video projectors by wire links 11a, 11b, 11c, 12a, 12b and 12c, using either three PCs with two video outputs or two PCs with three video outputs. The three PCs 10a, 10b and 10c are also connected 18, 19 to calculation means 7 or comprise calculation means 7 that have the role of precalculating the images 20a, 20b, 20c, 20d, 20e and 20f.

The virtual shop also comprises second calculation means 13 for calculating a graphic 3D model, in three dimensions, (in a manner known in itself), of one of the objects 22 presented on the display case 20.   In the example embodiment shown, this calculation means 13 are separate from the other calculation means.   In other variant embodiments, they form part of the synchronization means 10.   They are connected 18, 19 through PCs 10a, 10b, 10c to video projectors 8a, 8b, 8c, 8d, 8e and 8f.   Thus it is possible to project the image of the calculated 3D objects on the screen 9.   The

virtual shop shall also comprise a user – virtual
display case interface in the form of a trolley 14 like
that used by shoppers in supermarkets. The interface 14
comprises manipulation means 15 for virtually
manipulating the said object 22. These manipulation
means 15 comprise a three-dimensional positioning sensor
with six degrees of freedom in the form of a ball that
the user 2 holds in his or her hand. The manipulation
means are interconnected 17, 18 to the 3D object
calculation means 13. It is thus possible to sense the
movements of the hand of the user 2 and manipulate a
modelled 3D object 22. Thus, as in a real shop, the
user can pick up the 3D representation of the product 22
that he is considering purchasing, on the display case.
He or she can also move it and rotate it in all
directions to read the information printed on the
packaging. He or she can then put it in the trolley, if
required. During these operations, the user retains the
display case 20 in his or her field of vision, with all
the other objects 23 presented on it. In the case of
the variant embodiment described, the calculation means
13 and the manipulation means 15 are designed so that
only one modelled 3D object 22 can be manipulated during
the manipulation phase, to reduce the necessary
calculating power without reducing the realism of the
virtual show area. Photographic quality could be used
for these synthesized images. Since the calculation
means are no longer being used to calculate the
background scenes, the entire calculation power is
released to manipulate the product in the foreground.
Speeds of 25 to 30 images per second are possible.

The virtual shop 1 can also be used to simulate the
entire shop and the behaviour of a consumer moving
around in alleys searching for a display case containing
the products that he or she is looking for.
Consequently, the trolley 14 includes control means 16

that the user 2 can use to indicate the direction in which he or she wants to go and the display case in which the objects that he or she wants to see and/or manipulate are located. In the variant embodiment described, the control means 16 comprise position and/or orientation sensors. Conventionally, the user applies pressure on these control means 16 similar to the pressure that a person would normally apply on the handle of the trolley. The virtual shop comprises third calculation means 17, 17b and 17c associated with the PCs 10a, 10b and 10c and the video projectors 8a, 8b, 8c, 8d, 8e and 8f, to make the simulation. These calculation means 17a, 17b, 17c are interconnected to the control means 16. They recalculate the images 20a, 20b, 20c, 20d, 20e, 20f projected on the screen 9 in real time as a function of the information supplied by the user 2 actuating the control means 16. Therefore screen 9 simulates relative movement of the user 2 in the shop 1 or the user turning around relative to the display case in front of which he or she is located. In practice, the trolley 14 remains in the same place or is moved slightly by being oriented differently in front of screen 9.

CLAIMS

1.   Process for making a virtual show area (1), and particularly a virtual shop, at nominale scale in which the user (2) is immersed in an environment corresponding to the environment of a real show area, particularly concerning the dimensions (3, 4), the distances (5) and the field of vision (6)
the said process comprising the following steps:
-       the basic image representing a display case (20) at nominal scale, particularly shelves (21), is broken down into a predetermined number of precalculated sub-images (20a, 20b, 20c, 20d, 20e, 20f),
-       the precalculated sub-images (20a, 20b, 20c, 20d, 20e, 20f) are projected without overlap onto a screen (9) using several video projectors (8a, 8b, 8c, 8d, 8e, 8f), particularly six, to form a high-resolution image with the real dimensions of a display case (20),
-       the said video projectors(8a, 8b, 8c, 8d, 8e, 8f) are synchronized by means of at least one personal computer (10),
        such that the high-resolution image built up from the projected sub-images (20a, 20b, 20c, 20d, 20e, 20f) by the video projectors(8a, 8b, 8c, 8d, 8e, 8f) forms a virtual display case (20),

the said process also comprising the following steps:

- a graphic model of one of the objects (22) presented on the display case (20) is created in three dimensions,

- the said virtual object (22) is manipulated by means of a user-virtual display case interface (14, 15),

such that, as in a real show area, the user can pick up the 3D representation of the virtual object (22) on the display case (20), move it and turn it in all directions while keeping the display case (20) within his field of vision in the background at nominal scale alongside the other objects (23) presented on it.

2. Process according to claim 1, such that:

- the said video projectors (8a, 8b, 8c, 8d, 8e, 8f) are synchronized by means of several networked personal computers (10a, 10b, 10c), and particularly three.

3. Process according to claim 1 such that the necessary calculation power is reduced without reducing the realism of the virtual show area, by:

- manipulating a single modelled 3D object (22) during the manipulation phase.

4. Process according to claim 1 such that a modelled 3D object is manipulated:

- by sensing the movements of the user's hand(s) by means of a three-dimensional positioning sensor (15) with six degrees of freedom, connected (17) to the user - virtual display case interface (14);

the said user - virtual display case interface being in the form of a trolley (14) with the same characteristics as the trolleys used in show areas.

5. Process according to claim 4, such that the three-dimensional positioning sensor is in the form of a manipulable object, particularly a parallelepiped or a ball (15) that the user (2) holds in his or her hand.

6. Process according to claim 1, such that the user - virtual display case interface (14) comprises control means (16) that the user can use to indicate the display case on which the object(s) that he or she wants

5   to see and/or manipulate are located,
the said process also comprising the step in which
-    images (20a, 20b, 20c, 20d, 20e, 20f) projected onto the screen (9) are changed as a function of information provided by the user (2),

10   such that the process can simulate a movement of the user in the show area.

7. Process according to claim 6, such that the control means (16) comprise position and/or orientation sensors, particularly located on the trolley;

15   the said process also comprising the step in which
-    the user's position and/or orientation relative to the virtual display case can be changed.

8. Virtual show area, particularly a virtual shop (1), at nominal scale, such that the user (2) is

20   immersed in an environment corresponding to the environment of a real show area, particularly concerning the dimensions (3, 4), distances (5) and the field of vision (6),
the said virtual show area comprising:

25   -   first calculation means (7) to break down the basic image (20) representing a display case at nominal scale, particularly shelves (21), in a predetermined number of precalculated sub-images (20a, 20b, 20c, 20d, 20e, 20f),

30   -   several video projectors (8a, 8b, 8c, 8d, 8e, 8f), advantageously six, designed to project the precalculated sub-images (20a, 20b, 20c, 20d, 20e, 20f) onto a screen without overlap, to form a high-resolution image with the real dimensions of a display case (20),

- synchronization means to synchronize the said video projectors using several, and advantageously three, networked personal computers (10a, 10b, 10c),

such that the high-resolution image (20) composed of sub-images (20a, 20b, 20c, 20d, 20e, 20f) projected by the video projectors (8a, 8b, 8c, 8d, 8e, 8f) forms a virtual display case (20),
the virtual display area also comprising:

- second calculation means (8) for calculating a graphic model of one of the objects (22) displayed on the display case (20), in three dimensions,

- a user – virtual display case interface (14) comprising manipulation means (15) for virtually manipulating the said object (22),

such that, like in a real display area, the user can pick up the 3D representation of the virtual object (22) on the display case, move it and rotate it in all directions while the display case (20) and other objects (23) presented with the display case remain in the background within his field of vision at nominal scale.

9. Virtual show area according to claim 8, such that it comprises several, and advantageously three, networked personal computers (10a, 10b, 10c), to control the synchronization of the said video projectors (8a, 8b, 8c, 8d, 8e, 8f).

10. Virtual show area according to claim 8, such that in order to reduce the necessary calculation power without reducing the realism of the virtual show area,

- the manipulation means only manipulate one modelled 3D object (22) during the manipulation phase.

11. Virtual show area according to claim 9, such that the user – virtual display case interface (14) comprises a three-dimensional positioning sensor with six degrees of freedom (15), so that the movements of the hand(s) of the user (2) can be sensed and a modelled 3D object (22) can be manipulated;

the said user - virtual display case interface being specifically in the form of a trolley (14) with the same characteristics as trolleys used in show areas.

12. Virtual show area according to claim 11, such that the three-dimensional positioning sensor is in the form of a manipulable object, particularly a parallelepiped or a ball (15) that the user holds in his or her hand.

13. Virtual show area according to claim 8, such that the user - virtual display case interface comprises control means (16) that the user (2) can use to indicate the display case on which the objects that he or she wants to see and/or manipulate are located;

the said virtual show area comprises third calculation means (17a, 17b, 17c) for changing the images (20a, 20b, 20c, 20d, 20e, 20f) projected on the screen (9) as a function of the information supplied by the user (2);

such that the screen (9) simulates a displacement of the user (2) in the show area.

14. Virtual show area according to claim 13, such that the control means (16) include position and/or orientation sensors, particularly located on the trolley.

Inventor: FUCHS et al.
Docket No.: 9320.128USWO
Title. VIRTUAL SHOW AREA AT NOMINAL SCALE
Attorney Name. John J. Gresens
Phone No 612.371 5265
Sheet 1 of 2

09/856002

1/2

Fig. 1

Inventor: FUCHS et al.
Docket No.: 9320.128USWO
Title: VIRTUAL SHOW AREA AT NOMINAL SCALE
Attorney Name John J. Gresens
Phone No· 612 371 5265
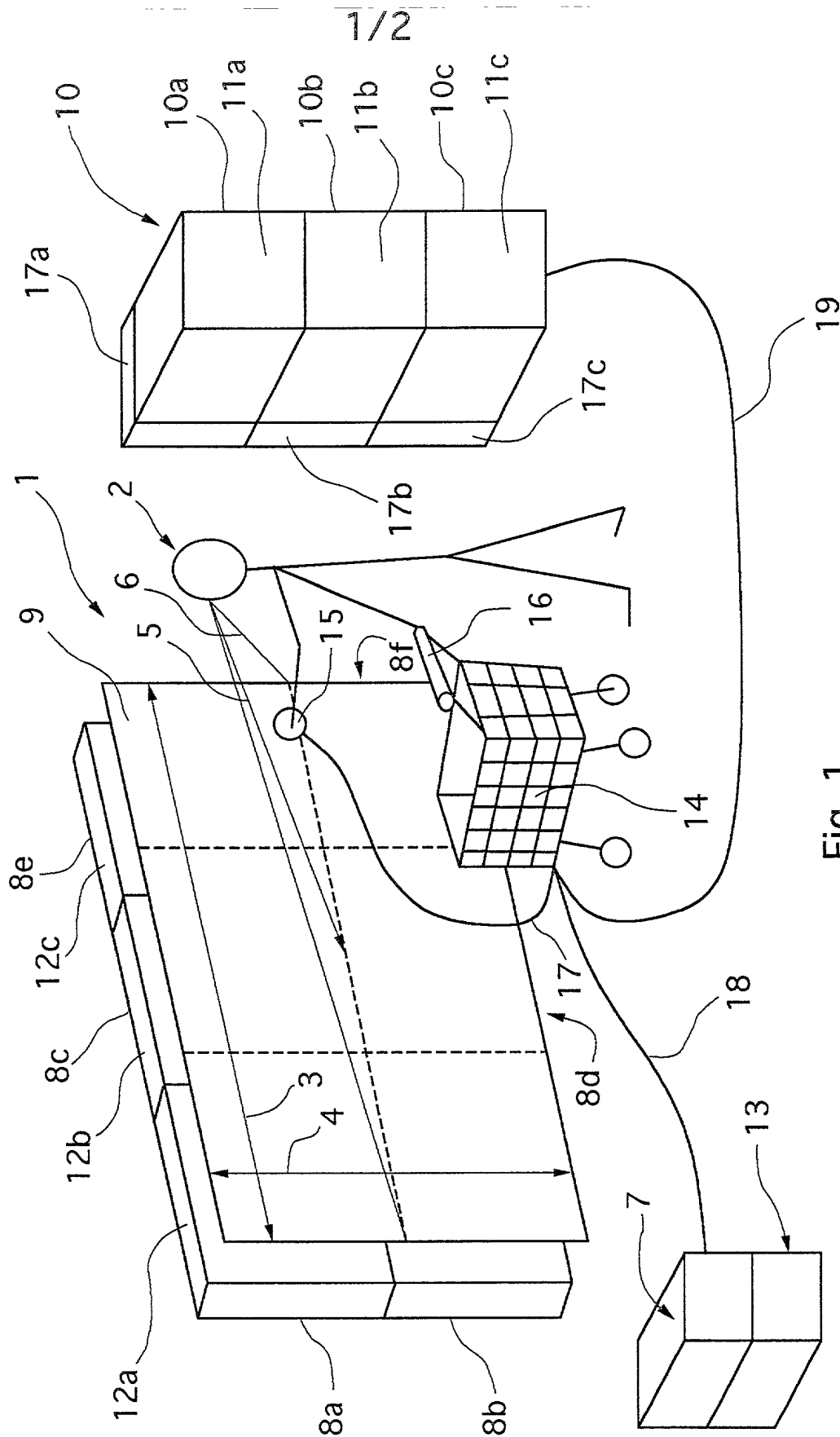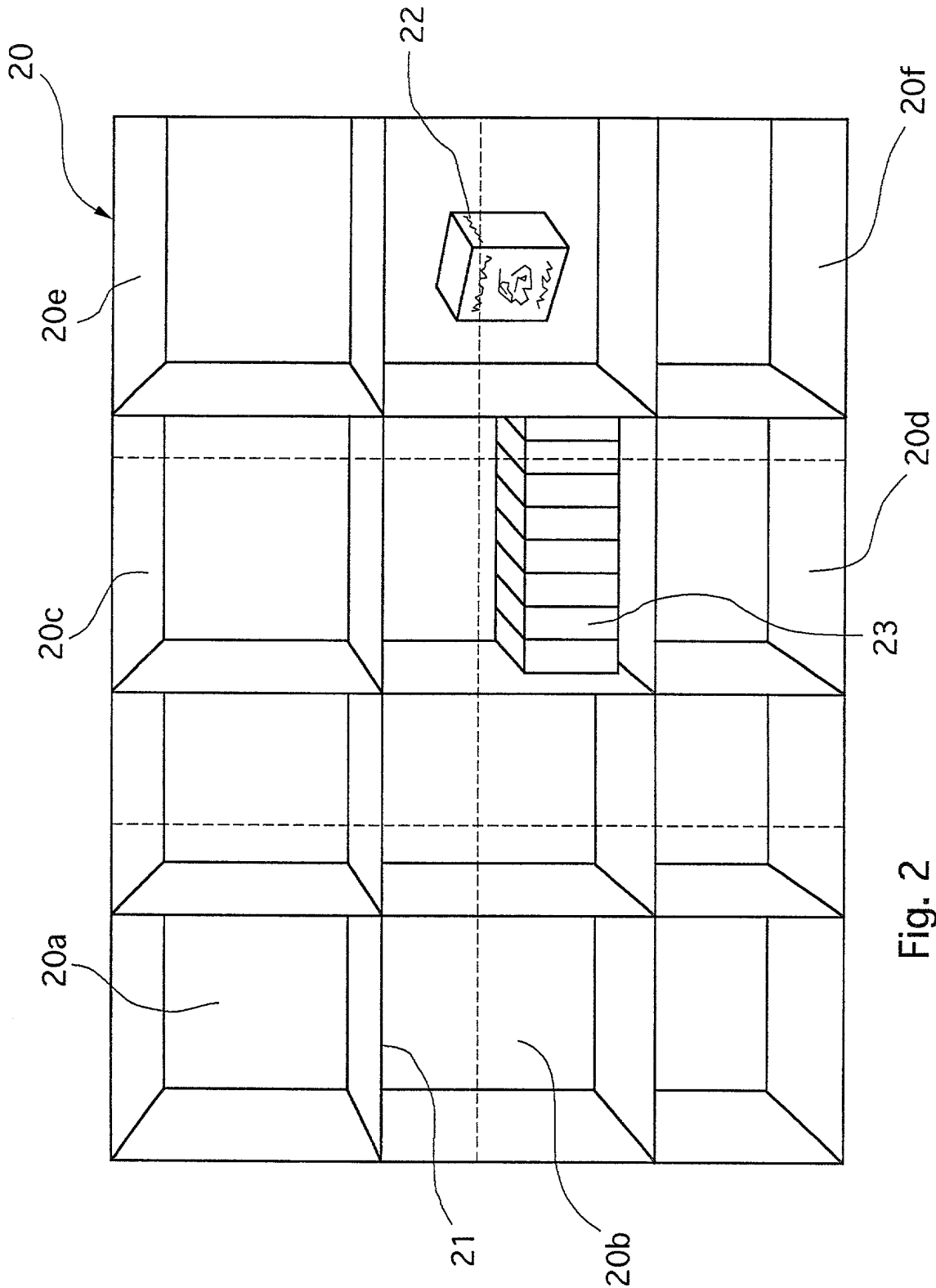Sheet 2 of 2

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Fig. 2

MERCHANT & GOULD P.C.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that: my residence, post office address and citizenship are as stated below next to my name; that

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: VIRTUAL SHOW AREA AT NOMINAL SCALE

The specification of which

a. ☐ is attached hereto

b. ☒ was filed on   as application serial no.   and was amended on   (if applicable) (in the case of a PCT-filed application) described and claimed in international no. PCT/FR99/02812 filed November 16, 1999 and as amended on   (if any), which I have reviewed and for which I solicit a United States patent.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

a. ☐ no such applications have been filed.

b. ☒ such applications have been filed as follows:

FOREIGN APPLICATION(S), IF ANY, CLAIMING PRIORITY UNDER 35 USC § 119			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)
France	98 14515	16 November 1998	
ALL FOREIGN APPLICATION(S), IF ANY, FILED BEFORE THE PRIORITY APPLICATION(S)			
COUNTRY	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	DATE OF FILING (day, month, year)	STATUS (patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

U.S. PROVISIONAL APPLICATION NUMBER	DATE OF FILING (Day, Month, Year)

I acknowledge the duty to disclose information that is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56 (reprinted below):

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Albrecht, John W.	Reg. No. 40,481	Leonard, Christopher J.	Reg. No. 41,940
Ali, M. Jeffer	Reg. No. 46,359	Liepa, Mara E.	Reg. No. 40,066
Anderson, Gregg I.	Reg. No. 28,828	Lindquist, Timothy A.	Reg. No. 40,701
Batzli, Brian H.	Reg. No. 32,960	Mayfield, Denise L.	Reg. No. 33,732
Beard, John L.	Reg. No. 27,612	McDonald, Daniel W.	Reg. No. 32,044
Berns, John M.	Reg. No. 43,496	McIntyre, Jr., William F.	Reg. No. 44,921
Black, Bruce E.	Reg. No. 41,622	Mitchem, M. Todd	Reg. No. 40,731
Branch, John W.	Reg. No. 41,633	Mueller, Douglas P.	Reg. No. 30,300
Bremer, Dennis C.	Reg. No. 40,528	Nichols, A. Shane	Reg. No. 43,836
Bruess, Steven C.	Reg. No. 34,130	Parsons, Nancy J.	Reg. No. 40,364
Byrne, Linda M.	Reg. No. 32,404	Pauly, Daniel M.	Reg. No. 40,123
Campbell, Keith	Reg. No. 46,597	Phillips, John B.	Reg. No. 37,206
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Clifford, John A.	Reg. No. 30,247	Qualey, Terry	Reg. No. 25,148
Coldren, Richard J	Reg. No 44,084	Reich, John C.	Reg. No. 37,703
Daignault, Ronald A.	Reg. No. 25,968	Reiland, Earl D.	Reg. No. 25,767
Daley, Dennis R.	Reg. No. 34,994	Roberts, Fred	Reg. No. 34,707
Dalglish, Leslie E.	Reg. No. 40,579	Samuels, Lisa A.	Reg. No. 43,080
Daulton, Julie R.	Reg. No. 36,414	Schmaltz, David G.	Reg. No. 39,828
DeVries Smith, Katherine M.	Reg. No. 42,157	Schuman, Mark D.	Reg. No. 31,197
DiPietro, Mark J.	Reg. No. 28,707	Schumann, Michael D.	Reg. No. 30,422
Edell, Robert T.	Reg. No. 20,187	Scull, Timothy B.	Reg. No. 42,137
Epp Ryan, Sandra	Reg. No. 39,667	Sebald, Gregory A.	Reg. No. 33,280
Glance, Robert J.	Reg. No. 40,620	Skoog, Mark T.	Reg. No. 40,178
Goggin, Matthew J.	Reg. No. 44,125	Spellman, Steven J.	Reg. No. 45,124
Golla, Charles E.	Reg. No. 26,896	Stoll-DeBell, Kirstin L.	Reg. No. 43,164
Gorman, Alan G.	Reg. No. 38,472	Sullivan, Timothy	Reg. No. 47,981
Gould, John D.	Reg. No. 18,223	Sumner, John P.	Reg. No. 29,114
Gregson, Richard	Reg. No. 41,804	Swenson, Erik G.	Reg. No. 45,147
Gresens, John J.	Reg. No. 33,112	Tellekson, David K.	Reg. No. 32,314
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Knearl, Homer L.	Reg. No. 21,197	Witt, Jonelle	Reg. No. 41,980
Kowalchyk, Alan W.	Reg. No. 31,535	Wu, Tong	Reg. No. 43,361
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I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct Merchant & Gould P.C. to the contrary.

I understand that the execution of this document, and the grant of a power of attorney, does not in itself establish an attorney-client relationship between the undersigned and the law firm Merchant & Gould P.C., or any of its attorneys.

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Please direct all correspondence in this case to Merchant & Gould P.C. at the address indicated below:

Merchant & Gould P.C.
P.O. Box 2903
Minneapolis, MN 55402-0903

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PATENT TRADEMARK OFFICE

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Signature of Inventor 201:	**Date:** 15th June 2001

2	**Full Name** **Of Inventor**	**Family Name** Laurgeau		**First Given Name** Claude	**Second Given Name**
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